Mrs. Hayden

Name Key **Date**_____

Geometry 201 Chapter 8 Proofs 2

(For #s 1 and 2, you are proving theorems, and may not use Theorem 8.1 and 8.2 as reasons.)

1. Given: Convex pentagon ABCDE (figure 1)

Prove: $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 = 540^\circ$

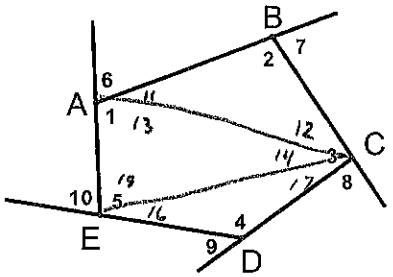


figure 1

Statements	Reasons
(1) ~	(1) Given
(2) Draw $\overline{AC}$ & $\overline{EC}$	(2) Through any 2 pts there is exactly one line
(3) $m\angle 2 + m\angle 11 + m\angle 12 = 180$ $m\angle 13 + m\angle 14 + m\angle 15 = 180$ $m\angle 16 + m\angle 17 + m\angle 4 = 180$	(3) Triang Angle Sum Thm
(4) $m\angle 2 + m\angle 11 + m\angle 12 + m\angle 13 + m\angle 14 + m\angle 15 + m\angle 16 + m\angle 17 + m\angle 4 = 540$	(4) Add
(5) $m\angle 1 = m\angle 11 + m\angle 13$ $m\angle 3 = m\angle 12 + m\angle 14 + m\angle 17$ $m\angle 5 = m\angle 15 + m\angle 16$	(5) AAP
(6) $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 = 540$	(6) Subst

2. Given: Convex pentagon ABCDE (figure 1)

Prove: $m\angle 6 + m\angle 7 + m\angle 8 + m\angle 9 + m\angle 10 = 360^\circ$ (You can use the results from #1)

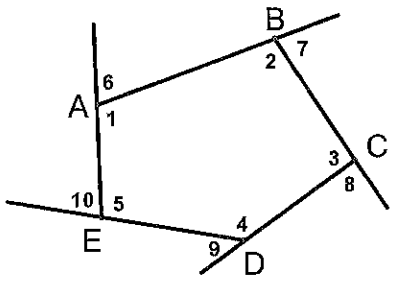
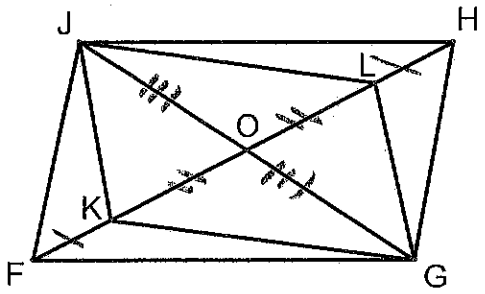


figure 1

Statements	Reasons
(1) ~	(1) Given
(2) $\angle 1 + \angle 6$ are L.P $\angle 2 + \angle 7$ $\angle 3 + \angle 8$ $\angle 4 + \angle 9$ $\angle 5 + \angle 10$ } are L.P	(2) def of L.P.
(3) $\angle 1 + \angle 6$ $\angle 2 + \angle 7$ $\angle 3 + \angle 8$ $\angle 4 + \angle 9$ $\angle 5 + \angle 10$ } are suppl.	(3) L.P.P.
(4) $m\angle 1 + m\angle 6 = 180$ $m\angle 2 + m\angle 7 = 180$ $m\angle 3 + m\angle 8 = 180$ $m\angle 4 + m\angle 9 = 180$ $m\angle 5 + m\angle 10 = 180$	(4) def of suppl.
(5) $m\angle 1 + m\angle 6 + m\angle 2 + m\angle 7 + m\angle 3 + m\angle 8 + m\angle 4 + m\angle 9 + m\angle 5 + m\angle 10 = 900$	(5) Add
(6) $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 = 540$	(6) Int $\angle$ Sum thm (Thm 8.1)
(7) $m\angle 6 + m\angle 7 + m\angle 8 + m\angle 9 + m\angle 10 = 360$	(7) Subtr.

3. Given: ▱KGLJ; FK = LH

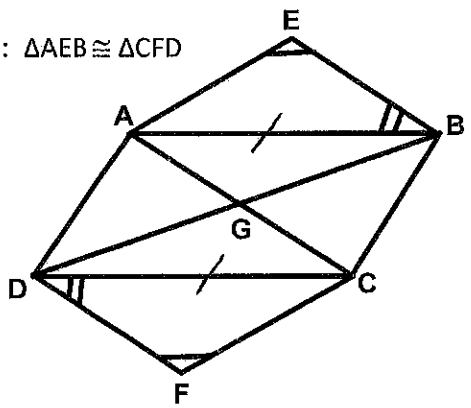
Prove: FGHJ is a ▱



Statements	Reasons
(1) ~	(1) Given
(2) $\overline{JO} \cong \overline{GO}$, $\overline{KO} \cong \overline{LO}$	(2) diagonals of ▱ bisect each other
(3) $KO = LO$	(3) def of $\cong$
(4) $FK + KO = LH + LO$	(4) Add
(5) $FK + KO = FO$ $LH + LO = HO$	(5) SAP
(6) $FO = HO$	(6) Subs
(7) $\overline{FO} \cong \overline{HO}$	(7) def $\cong$
(8) FGHJ is ▱	(8) If diag bisect each other, then quad is ▱

4. Given: ▱ABCD, $\angle AEB \cong \angle DFC$, $\angle EBA \cong \angle FDC$

Prove: $\Delta AEB \cong \Delta CFD$



Statements	Reasons
(1) ~	(1)
(2) $\overline{AB} \cong \overline{DC}$	(2) Opp sides of ▱ $\cong$
(3) $\Delta AEB \cong \Delta CFD$	(3) AAS

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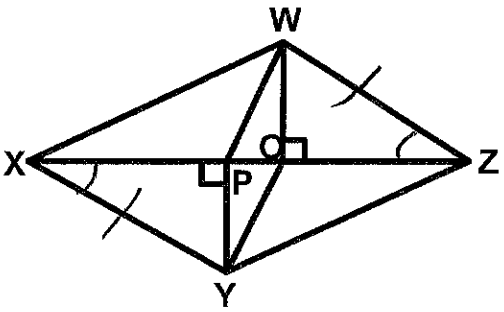
5. Given: $\square WXYZ$, $\overline{ZO} \perp \overline{WO}$, $\overline{XP} \perp \overline{YP}$

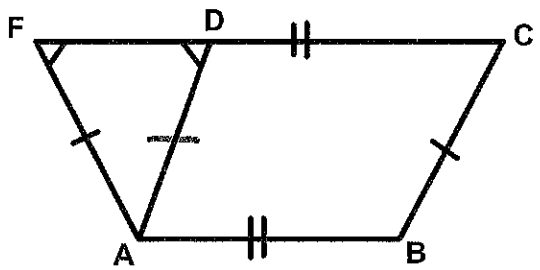
Prove: WOYP is a parallelogram



Statements	Reasons
(1) ~	(1) G
(2) $\overline{WZ} \parallel \overline{XY}$	(2) def of $\square$
(3) $\overline{WZ} \cong \overline{XY}$	(3) opp sides $\square \cong$
(4) $\angle WZO \cong \angle YXP$	(4) Alt. Int $\angle$s Thm
(5) $\angle WOZ$ is Rt $\angle$ $\angle XPY$ is Rt $\angle$	(5) def of $\perp$
(6) $\angle WOZ \cong \angle XPY$	(6) Rt $\angle$s $\cong$
(7) $\triangle WOZ \cong \triangle YPX$	(7) AAS
(8) $\overline{WO} \cong \overline{YP}$	(8) CPCTC
(9) $\overline{WO} \parallel \overline{YP}$	(9) Alt ext conv.
(10) WOYP is $\square$	(10) If one pair of opp sides is Both $\cong$ + $\parallel$, then Quad is a $\square$

6. Given: $\overline{AB} \cong \overline{CD}$, $\overline{BC} \cong \overline{AF}$, $\angle AFD \cong \angle ADF$

Prove: ABCD is a parallelogram



Statements	Reasons
(1) ~	(1) Given
(2) $\overline{AF} \cong \overline{AD}$	(2) Conv. $\triangle$ BAT
(3) $\overline{AD} \cong \overline{BC}$	(3) Subst (Trans)
(4) ABCD is $\square$	(4) If both pairs of opp sides $\cong$ then Quad is $\square$